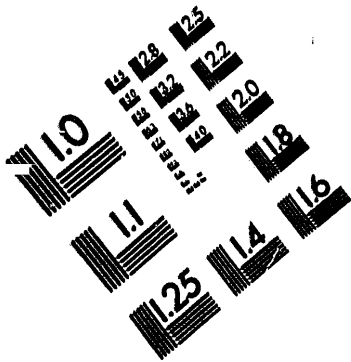


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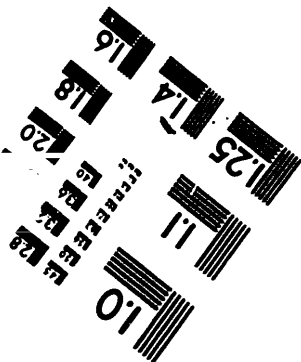
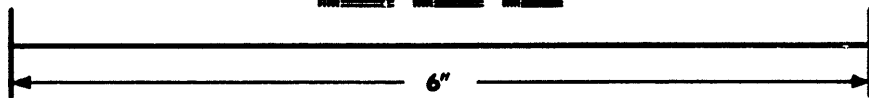
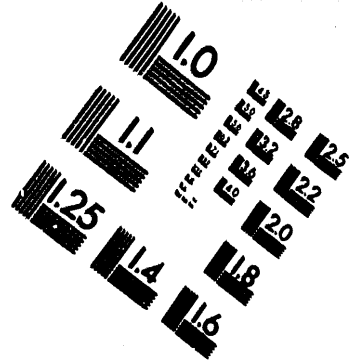
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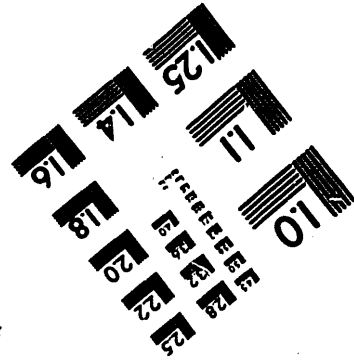


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(FOUO 3/79)

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TRANSLATIONS ON ENVIRONMENTAL QUALITY

(FOUO 3/79)

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INTER-AFRICAN AFFAIRS

NINETEEN COUNTRIES FIGHTING POLLUTION IN GULF OF GUINEA

Monrovia THE LIBERIAN AGE in English 6 Mar 79 p 7

[Text] Geneva--About 13 million people living along the shores of the Gulf of Guinea, many of them in some of Africa's premier capital cities, and all of them are increasingly affected by the growing pollution of the gulf. Now, 19 nations have grouped together to fight that pollution.

Nineteen countries around the Gulf of Guinea in West Africa have banded together to save their coastlines from large-scale pollution.

The gulf is a vast arm of the Atlantic Ocean washing beaches from the Ivory Coast to Gabon, with two inner bays, the Bight of Benin and the Bight of Biafra. Growth of concern at the rising rate of pollution experienced along its beaches has led to the 19 nations affected--Angola, Benin, Cameroon, the Cape Verde Islands, the Congo, Gabon, The Gambia, Ghana, Guinea-Bissau, Ivory Coast, Liberia, Niger, Nigeria, Equatorial Guinea, Sao Tome and Principe, Senegal, Sierra Leone, Togo and Zaire--joining the World Health Organisation and United Nations' agencies to set up a programme to safeguard the environment.

The contrast between unspoiled golden beaches on the one hand and polluted harbours, sewage-soiled lagoons and dead fish on the other has served to jolt the governments of the region into action. They have as a warning the evidence of what can happen when too much pollution is not tackled until too late--as in parts of the Mediterranean Sea.

Rapid industrialisation, new ports and harbours and consequent development of town and cities has played an important part in the soiling of the Gulf of Guinea's previously untouched beaches. The impact has not only affected tourists, but has also been felt by millions of people who live along the shoreline.

About 150 million people live in the 19 affected countries--almost half of them in Nigeria alone--and the estimated population of the shore region of the gulf would be about 13 million of them. Most of the region's capitals--

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Freetown, Monrovia, Abidjan, Lome, Lagos, Accra and Luanda among them--are on the shores of the gulf and the entire coastal region's population is growing faster than the inland areas.

Even cities not on the gulf play their part in soiling it, by polluting rivers which flow into it, such as the Congo, the Niger and the Volta.

The polluted water spreads disease among the shore-dwellers, such as typhoid, dysentery and polio. Another problem is cholera which has become widespread in the region, thriving on the polluted water it finds. Oyster beds are often located near untreated sewage outlets, and pass on disease when eaten, because they contain disease microorganisms filtered into them from the polluted water. Contaminated shellfish have caused outbreaks of food poisoning and disease in Africa and Europe in recent years because of this. WHO has as a result issued a manual on shell-fish hygiene.

Hidden pollution such as this poses another threat, epitomised by the Minamata disease, first observed in the Japanese village which has given it its name. There, fishermen and their families were crippled by mercury poisoning caused by eating polluted fish.

As well as mercury, other dangerous minerals can be found in polluted water: cadmium, antimony and arsenic among them. Pesticides (six Gulf of Guinea countries manufactured in 1972 more than 9,000 metric tonnes of pesticides) and industrial waste find their way into the sea, fouling lagoons and estuaries.

Oil is another cause of pollution in the Gulf--Angola, Gabon and Nigeria produced more than 130 million tons in 1977 and Zaire and Congo have also big reserves. Most is exported, but enough remains as a legacy on tarred beaches.

What is planned is a coastal water quality programme and the countries and agencies concerned working together on a four-stage approach: assessment of the degree of pollution; determination of water quality; establishment of criteria for defining "acceptable risk"; and the development of control strategies and appropriate legislation.

Oyster beds, for example, will be sited far enough away from sewage outfalls to make [words illegible] safe from health [words illegible] and the same will [words illegible] to bathing beaches [remainder of article illegible].

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USSR

EXPERT APPRAISAL AND MONITORING OF THE ENVIRONMENT

Moscow SOVETSKOYE GOSUDARSTVO I PRAVO in Russian No 10, Oct 78 pp 91-97

[Article by Yu. S. Shemshuchenko, senior scientific worker of the Institute of State and Law of the Ukrainian SSR Academy of Sciences, candidate of jurisprudence: "Comprehensive Expert Ecological Appraisal and Monitoring of the Environment"]

[Text] In providing for high quality of man's environment in the Soviet Union, as in other countries of the world, in recent years preference has been given to organizational-legal institutions of a preventive nature. This is related to a change in emphasis in protection of the environment from the harmful result of production activity to the process of production itself, to the stage of planning the utilization of nature and construction. One of the institutions that has this direction is comprehensive expert ecological appraisal of construction plans.

Comprehensive Expert Ecological Appraisal

In the USSR comprehensive expert ecological appraisal is being conducted for several large construction plans by the USSR Gosplan and the USSR Gosstroy. It is being carried out partially by a number of other ministries and departments and design organizations. Republic committees for the protection of nature engage extensively in this activity.

Under the Ninth Five-Year Plan agencies of the State Committee for Protection of Nature of the Ukrainian SSR Council of Ministers, for example, gave an expert ecological appraisal to 10,855 sets of material on selecting construction sites and 12,627 technical designs for construction. Of the designs that were considered, 1,145 were rejected or sent for reworking because of violations of requirements for the protection of nature. In 1976 this committee and its inspection team considered 3,836 sets of materials on selecting construction sites and 2,243 technical designs. Of these, 133 sets of materials and 104 designs were not accepted. Thus the technical plan for locating the production of nonferrous sulfurous dyes at the Rubezhanskaya Krasitel' production association was not approved because of the fact that its implementation could cause a significant deterioration

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of the environment in this region. Materials for the plan for reconstructing an asphalt-concrete plant in Novoaydarskiy Rayon in Voroshilovgradskaya Oblast were returned for reworking because of the lack of developments for protecting the atmospheric air; the design for the reconstruction of the Rozhishche cheese plant in Volynskaya Oblast was not approved since an increase in the capacities of purification equipment was not envisioned along with the increase in the enterprise's capacities. Measures taken by the committee made it possible in 1976 to retain about 3,000 hectares of agricultural land and 600 hectares of forest in the first group.¹

The expert appraisals conducted by the State Committee for the protection of nature of the Ukrainian SSR Council of Ministers have a number of advantages over comprehensive expert ecological appraisal conducted by special commissions that have been created in each specific case by the republic gosstroy. The latter is a one-time expert appraisal that embraces a relatively small part of larger construction objects. Many other objects also need expert appraisal and to provide this is possible only when it is handled by a permanently functioning state staff. Therefore the introduction of comprehensive expert ecological evaluation on a union level, in our opinion, should involve a system of agencies that was created in March 1968, the State Committee for Hydrometeorology and Control over the Natural Environment of the USSR.

A most important requirement for expert ecological appraisal is objectivity. Observance of this requirement could hardly be insured by such a department as the USSR Gosstroy (the gosstroys of the union republics), since its primary task is to fulfill plans for capital construction. The activity of institutions and organizations under the jurisdiction of the USSR Gosstroy which carry out capital construction itself requires objective ecological evaluation. To place the responsibility for an expert ecological appraisal on the State Committee for Hydrometeorology and Control of the Natural Environment of the USSR which is superdepartmental, in our opinion, could lead to disinterested correction of mistakes allowed in the process of planning and construction by institutions and organizations of the USSR Gosstroy and other construction ministries. It seems expedient to utilize more extensively for expert evaluation the most important national economic plans of the Interdepartmental Scientific and Technical Council for Comprehensive Problems of Protection of the Natural Environment and Rational Utilization of Natural Resources under the State Committee of the USSR Council of Ministers for Science and Technology and also the corresponding republic councils.

Along with improvement of the mechanism of superdepartmental expert ecological appraisal, the expert appraisal conducted by individual ministries and departments also needs organizational improvement. As distinct from superdepartmental expert appraisal which is conducted, as a rule, in terms of already completed developments of scientific and technical documentation, departmental expert ecological appraisal of plans for construction is

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carried out comprehensively--along with the development of the basic technical documentation. In the process of such expert appraisal it is easier to change the technical and economic substantiation of the plan or the plan itself, from the point of view of the interests of the protection of nature and to provide for their coordination with all other tasks. Taking into account the great significance of departmental expert ecological appraisal, one should reinforce existing divisions of ministries and departments for expert appraisal with specialists of a nature protection profile and also increase the role of scientific and technical councils under ministries and departments in solving the corresponding problems, which would correspond to the tasks arising from the decree of the CPSU Central Committee and the USSR Council of Ministers, "On Improving Planning Estimate Work," of 28 May 1969.²

Interesting experience in producing comprehensive expert ecological appraisals of plans for construction has been accumulated in other countries with which the Soviet Union cooperates in the protection of nature. In the United States, for example, the main form of expert ecological appraisal is notification of the effects of the planned industrial and other facilities on the environment.

Since 1970 when this institution was introduced federal departments annually publish an average of about 3,000 such notifications. The essence of the notifications consists in the obligation of those who undertaken appraisals and state agencies publicly and privately to announce possible effects of the planned construction on the environment. The notifications are drawn up on the basis of ecological appraisals of plans that are carried out in keeping with internal rules adopted by more than 40 federal departments. In the standard publication of the announcement which, as a rule, takes up from 10 to 60 pages (the notification concerning the questionable design of a petroleum pipeline through Alaska, however, took six volumes), according to a law of 1969 concerning the national policy in the area of protection of the environment, should elucidate the following issues: the effect of the plan on the environment; irreversible results of implementation of the plan; alternatives to the proposed measures; the interconnection between short- and long-term consequences for the environment and any irreversible commitments with respect to resources.³

The procedure for publicly making the environmental impact statement, which is regulated by special instructions, envisions the publication of a draft of the announcement in the press and reference to it for consideration by central and local departments and also the corresponding federal agencies which have work experience in the area of protection of the environment. Interested agencies and public organizations and also citizens can make remarks orally or in written form and make proposals for improving the plan for construction from the point of view of the interests of the protection of nature. A failure to respond is tantamount to having no objections.

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After such a preliminary environmental impact statement the corresponding department draws up a final variant of the announcement, taking into account the remarks and suggestions that have been made. This variant along with the remarks is sent to the Agency for Protection of the Environment (for less important projects the corresponding state and county agencies have the right to consider them) no less than 30 days before the beginning of construction. The agency studies the notification and, if necessary, provides an additional expert appraisal of the plan with the help of specialists, after which it considers the plan acceptable, acceptable with certain changes or unacceptable. When the plan is considered unacceptable the agency takes measures to convince the author of the plan that its implementation is inexpedient. If the agency does not succeed in doing this it sends the environmental impact statements of federal agencies to the Council on the Quality of the Environment or brings a legal suit to stop the construction. The Council for the Quality of the Environment, like the agency, is not authorized to veto plans that are in opposition to the interests of the protection of nature. It also uses the method of persuasion or recommends to the president that the implementation of the plan be stopped. However the council rarely resorts to this measure. As a result, the majority of cases of this category are resolved by the court. In approximately 15 out of 100 cases the latter decide to halt the implementation of plans for construction which can exert a negative influence on the condition of the environment.⁴

To produce an all-around expert ecological evaluation of plans for construction presupposes that the institutions that do the expert evaluations have the necessary information base concerning the condition and tendencies to change of the surrounding environment in the region of construction. In the Soviet Union information about protection of the environment and the utilization of natural resources at the present time is gathered by numerous ministries and departments, public organizations, VUZ's and scientific research institutions. But they are frequently of a fragmentary nature, are not developed and are not distributed under a centralized policy, which complicates their utilization by agencies that are making expert ecological evaluations and other agencies and organizations. Consequently it becomes obviously necessary to organize a unified system of observations, collection, processing and dissemination of information concerning the condition of the environment, that is, the introduction of a system that is presently called monitoring.

Monitoring of the Environment

Monitoring the environment on a global level was first discussed at the end of the 1960's and already by 1971 a special commission of the Scientific Committee for Problems of the Environment of the International Council of Scientific Unions formulated the concept of monitoring which was adopted at the Stockholm conference on problems of the environment in 1972. Somewhat later it became a constituent part of the UN program for environmental protection (UNEP). In 1974 in Nairobi there was an

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intergovernmental conference on monitoring which made the first attempt to establish its primary task and in 1975-1977 organizational questions of the development of a global system for monitoring the environment were discussed at regular meetings of the council of managers of the UNEP, which considered monitoring "as a process of regular observation of individual parameters of the environment, their changes and interpretations for specific ends."⁵

In spite of the fact that the idea of global monitoring has already received a certain amount of practical implementation, there are many difficulties and unsolved problems related to its further functioning and development. The same can be said about national monitoring systems. In our country monitoring the environment means primarily a system of observations that makes it possible to establish changes in the condition of the biosphere under the influence of man's activity.⁶ The observations, consequently, should embrace the changes that are taking place under the influence of any factors, including the natural forces of nature, but with the establishment of anthropogenic changes that are subject to regulation on the part of state and the society. Sometimes the concept of monitoring has a broader content. In the opinion of I. P. Gerasimov, monitoring is not only a system of observations, but also a system of supervision and control of the condition of the environment that is exercised on various scales. I. P. Gerasimov proceeds from the idea that "observation," "supervision" and "control" with respect to the environment should be purposive, interconnected and effective (full-value) and that they do not have any strict and individual content. The content of "observation," the author writes, should necessarily include "supervision" in some form since observation of something that is done without any relation to control indicators of the observed phenomenon has no object. The same thing can be said of "supervision" of any phenomena without any "control" conclusions would only be "a thing in itself."⁷

Undoubtedly observation, supervision and control are concepts that are closely interconnected. Moreover, the concept of "control" integrates the concept of "observation" and "supervision." The arbitrary nature of observation and supervision, however, does not mean that they have any independent significance or specific tasks. The essence of observation consists in the collection, processing, storage, analysis and transmission of information. This is the first function of control which involves a direct and prompt influence of the state on social processes." Observation is a source of information not only for making decisions, but also for exercising control. The latter, as a method of providing for legality and state discipline, a method of administrative activity, relies on observation and is sometimes interwoven with it, but cannot be reduced to that. The function of supervision is more multifaceted and also consists in an evaluation of actions.⁹ It must establish whether or not the actual state of affairs established during the process of observation of the object corresponds to the earmarked goals and evaluate the supervised activity and take measures to eliminate shortcomings that are revealed.¹⁰ The specific

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significance of observation and supervision makes it possible to speak about the expressed peculiarity of these elements of control that appear as its independent stages or functions. I. P. Gerasimov, by expanding the meaning of monitoring, actually reduces it to control. But he himself recognizes that at the present time there is no possibility of implementing the suggestions he makes concerning monitoring "in some kind of complete form, that is, in an entire change of observation--supervision--control."¹¹ Therefore, by suggesting an expanded definition of monitoring, he actually goes beyond the framework of the concept of it as a system of observations of the condition of the environment.

The importance of monitoring lies not only in the gathering of information about the condition of individual elements of the environment, but in the analysis and evaluation of them, since only correctly evaluated information can be a scientific criterion for controlling the quality of the environment. An evaluation of the condition of the environment, including comparison, correlation and integration of the results of observation, is one of the most important general goals of monitoring, the culmination of the process of analysis of information obtained through it. But in the present stage it is not yet possible to produce an all-inclusive evaluation of the quality of the environment. Therefore the practice proceeds along the path of determining the primary goals of monitoring. The intergovernmental conference on monitoring in 1974, for example, formulated seven program goals for goal monitoring which were subsequently approved by the administrative council of the UNEP, namely: a) an expanded warning system concerning threats to the health of man; b) an evaluation of global pollution of the atmosphere and its consequences on the climate; c) an evaluation of the scale and distribution of pollutants in biological systems, particularly those related to nutrition; d) an evaluation of critical problems originated by the practice of industrial activity and land utilization; e) an evaluation of the reactions of terrestrial ecosystems on the ecological structure; f) an evaluation of the condition of pollution of the oceans and its consequences on marine ecosystems; g) an improved system of warning of international natural disasters.¹²

The purposes and tasks of monitoring in the USSR are conditioned by the needs of state agencies (including agencies that produce expert ecological appraisals of plans for construction) for certain kinds of information that is appropriately evaluated. This is information about the condition of the environment and its elements during the present period of time; about sharp changes in the level of pollution of the air and water basins; about sources of such pollution; and about tendencies in changes in the biosphere.

The practical usefulness of monitoring will depend on how close its future organizational structure is to the optimal. It is now being created on the basis of the statewide service for observation and control of the level of pollution of objects in the environment, which has been organized within the framework of the State Committee for Hydrometeorology

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and Control of the Environment of the USSR in keeping with the decree of the CPSU Central Committee and the USSR Council of Ministers, "On Stepping Up Environmental Protection and Improving Utilization of Natural Resources," of 29 December 1972.¹³

At the present time the hydrometeorological service conducts observations of the level of pollution of the soil, water and air with industrial wastes, of changes in the environment caused by the use of toxic chemicals, and of the level of radioactive pollution of the locality. These functions are performed by the following subdivisions of the service: a) in the USSR--by the administration for study and control of pollution of the environment (organization of the service, the USSR Hydrometeorological Center (operational information), scientific research institutes and laboratories of the hydrometeorological service (development of methods of observations and preparation of reference materials); b) in the union republics--by republic and territorial administrations of the hydrometeorological service, rayon radio meteorological centers, the Central Asian, Western Siberian and Far Eastern regional scientific research hydrometeorological services and operational and observation agencies under their jurisdiction (weather bureaus, hydrometeorological bureaus, hydrometeorological observatories, stations and posts). Thus the service for observation and control over the level of pollution of objects in the environment now consist of several levels. The first level consists of the territorial agencies and observatories, laboratories and observation points under their jurisdiction. The middle level consists of scientific research institutes which, in addition to scientific research, provide scientific and methodological guidance of the work for determining the levels of environmental pollution. And the highest level consists of the State Committee for Hydrometeorology and Control of the Environment of the USSR, which coordinates the work of the statewide service for observations and planning of its activity.

As of the beginning of 1976 there were 122 hydrometeorological observatories, 3,410 stations and 8,000 observation posts in operation within the system of the Hydrometeorological Service of the USSR. Under the current five-year plan it is intended to develop further the network of stations for observing pollution of the air, water and soil. For example, it has been proposed to organize the measurement of air pollution in 140 cities. Thus 300 cities of the country with an overall population of more than 100 million people will be included in the measurements.¹⁴

In addition to the Hydrometeorological Service, individual functions of ecological monitoring are performed by a number of other services. They include, in particular, the sanitary-epidermiological, hydrological, seismological, ionospheric and geological services, the service for radiation security, the veterinary and land use survey services, the plant protection service, and so forth. But they operate individually and only an insignificant part of their information regarding the protection of nature enters into the overall flow of information received by the statewide service for observation and control over the level of pollution of objects in the environment.

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The departmental approach to the organization of observations of the condition of the environment which predominates in this stage leads to a duplication of the activity of the corresponding services and to an unjustifiable dispersion of forces and funds. Observations of the quality of surface waters, for example, are now being carried out simultaneously by posts of the hydrometeorological service, inspection teams of the USSR Ministry of Land Reclamation and Water Management, sanitary-epidemiological stations of the USSR Ministry of Public Health, and posts of the USSR Ministry of the Fish Industry and the USSR Ministry of Power and Electrification. In terms of many indicators the water analyses conducted by these agencies coincide.

Further development of monitoring of the environment, in our opinion, will involve a convergence of environmental protection information into a unified flow. To accomplish this it is not necessary for all other observation services to be under the jurisdiction of the USSR State Committee for Hydrometeorology and Control of the Environment. It is apparently necessary to speak of the development of functions of monitoring in the activity of each of the aforementioned services on the basis of a single strategy. Hence there arises a need to determine the locations of the services in the statewide system of monitoring, to regulate their interrelations efficiently and to coordinate their activity closely. In our opinion, these issues can be resolved legally through adopting a unified Statute on Monitoring the Environment in the USSR.

When determining the basis of ecological monitoring in the statute it would be expedient to begin with the idea that monitoring should be an input source of objective information that is as complete as possible concerning the condition of the environment for agencies of various levels belonging to various branches. The system of monitoring, consequently, should be oriented, in the first place, toward determining the quality of the environment and the prospects for changes in it on the global, unionwide, regional and local levels and, in the second place, toward observing the level and nature of the utilization of natural resources. This orientation is useful from the point of view of combining the principles of territorial and branch control of the environment in the USSR and also the combination of the interests of our country with the interests of other countries in investigating and maintaining the ecological balance in the biosphere. It is essentially important to reflect in the statute the regular and daily nature of the observations, including the entire territory of the country and all elements of the environment, which will make it possible to note promptly forthcoming negative changes in the environment where man lives.¹⁵

Along with the introduction of an ecological monitoring service, it is necessary to resolve the issue of creating a single unionwide information center concerning environmental protection, having properly determined its legal status.

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In it should be concentrated not only information about the quality of the environment and the condition of the utilization of natural resources which are obtained from the monitoring service and state statistical agencies, but also information obtained from scientific institutions (about scientific and technical solutions to problems of the environment), from environmental protection agencies and public organizations (about advanced work practice), from procurators' agencies, courts, the Ministry of Internal Affairs, courts of arbitration (about the condition of the fight against violations of environmental protection legislation) and so forth. The duties of the center should include the compilation of informational abstracts concerning environmental protection, consultations and responses to questions, distribution of selected information, publication of reference materials and collections of information, dissemination of experience in environmental protection work, notification of the public concerning the condition and protection of the environment through mass media, and so forth.

Improvement of the institution of comprehensive expert ecological appraisal and the introduction of monitoring of the environment are a part of the larger issue of improving the mechanism for insuring rational utilization of nature.

FOOTNOTES

1. See RABOCHAYA GAZETA, 5 June 1977.
2. See SP SSSR, 1969, No 15, p 83.
3. See the appendix to the book by J. Sloan, "Environment and the Law," New York, 1971, pp 88-89.
4. See "Preparation of environmental impact statements: guidelines--Environmental Quality," Washington, 1974, pp 506-540; "EEC Symposium on questions of the environment," New York, 1971, pp 239-241.
5. "UN Program On the Environment" (UNEP Document (GC) 90, 15 March 1977, p 12).
6. See Yu. A. Izrael', "A Global Observation System. Prognosis and Evaluation of Changes in the Condition of the Natural Environment. Fundamentals of Monitoring" (METEOROLOGIYA I GIDROLOGIYA, 1974, No 7, p 4).
7. See I. P. Gerasimov, "Scientific Fundamentals of Modern Monitoring of the Environment" (IZVESTIYA AKADEMII NAUK SSSR, SERIYA GEOGRAFICHESKAYA, 1975, No 3, p 14).

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8. See "Administrativnoye pravo" [Administrative law], ed. by A. Ya. Lunev, Moscow, 1970, p 6.
9. "Sovetskoye administrativnoye pravo" [Soviet administrative law], ed. by Yu. M. Kozlov, Moscow, 1973, p 17.
10. See M. S. Studenikina, "Gosudarstvennyy kontrol' v sfere upravleniya" [State control in the sphere of administration], Moscow, 1976, p 7.
11. I. P. Gerasimov, op. cit., p 14.
12. See "UN Program on the Environment" (UNEP Document, (GC) 90, 15 March 1977, p 41).
13. See SP SSSR, 1973, No 2, article 6.
14. See METEOROLOGIYA I GIDROLOGIYA, 1976, No 7, p 7, 10.
15. See O. S. Kolbasov, "Ekologiya: politika--pravo" [Ecology: policy--law], Moscow, 1976, p 220.

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NORWAY

SMALL NORTH SEA OIL SPILLS CAUSE INCREASING DAMAGE

Oslo NORSK OLJE REVY in Norwegian in Norwegian No 1, 1979 pp 13-16

[Article by Professor John S. Gray: "Marine Life: Small Daily Oil Spills More Dangerous than Large Ones"]

Professor John S. Gray is a marine biologist who works at Oslo University. Presently he is on a Norwegian expedition in Antarctica.

[Text] The Amoco-Cadiz accident focused the news media's attention on the danger of oil to marine life. How great is this danger really? The instantaneous effect seems catastrophic, and the sight of seabirds covered by oil inevitably produces strong feelings. This article claims, however, that such a picture is not representative in the long run.

In reality continuous small discharges of oil are far more harmful than large spills. The Torrey-Canyon catastrophe resulted in over 60,000 dead seabirds, and current figures indicate that the Amoco-Cadiz accident will exceed that. But if we use a global scale criterion such catastrophic spills have a relatively minor effect on marine life.

In the North Sea alone 150,000 seabirds die every year because of small oil spills. These small, and seemingly insignificant discharges constitute the greatest potential danger for chronic negative effects on marine life, globally speaking.

Ekofisk-Oil Relatively Harmless, but not Always

It is important that we not overreact in regard to the dangers of oil-pollution. The natural breakdown process results in a rapid "detoxification" of the oil in areas where waves, winds and currents prevail. One example of this was the Bravo-blowout. The marine-biological investigations carried out after this accident in the Ekofisk-field revealed very little effect. Actually, a British study showed that the amount of zooplankton was greater in the area of the accident. Thus the only measurable effect was a stimulus! When the Bravo-blowout happened the Danes did not have any research vessel ready to be sent out. Then days after the blowout they got hold of a ship and took off with a full crew of scientists. This ship crisscrossed the Ekofisk area for 10 days without finding any trace of oil. So it appears clear that at least Ekofisk-oil is relatively harmless for marine life.

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In that regard this confirms that oil is a natural product which nature itself handles and breaks down. Fortunately this happens rapidly with North Sea oil and it becomes nontoxic in a short time. Crude oil, which contains greater amounts of aromatic-and asphalt components, takes much longer to break down.

The fact that North Sea oil is more harmless than, for example, oil from the Middle East does not mean that it does not cause extensive damage.

If the Bravo-blowout had happened a few weeks later, the result could have been very different. The Ekofisk-area is a center for spawning mackerel and nobody knows--or is willing to predict--what would have happened if the blowout had occurred during the spawning season of the mackerel. In the worst case, fishing might have been sharply reduced for a number of years in the future.

Cleaning Compounds May Pose Greater Danger than Oil

Oil spills in themselves may not be the greatest danger to marine life. Chemicals used after the Torrey-Canyon accident in 1967 caused extensive and longlasting damage to fauna and flora on the British coastline. In locations where this could be ascertained it was clear that the oil itself had been less toxic to marine life than the chemical compounds which were used. In places where the oil came ashore flora and fauna returned to normal after two years. But today, then years after the accident, there are many rocky areas still covered by light-green algae which were not there before the accident. These are the areas where chemicals were used to dissolve the oil. These chemicals killed the limpets (patella vulgata) which normally "graze" on these algae and thereby keep the rocks clean.

It should be added that extensive research was carried out after the Torrey-Canyon accident. This in turn led to the development of cleaning compounds which are just as effective, but only 1/1000 as toxic as the earlier ones.

Greatest Danger in Calm Waters

Here an important point should be made. If we look at the recolonization of an area subjected to catastrophic oil spills we see that in places where waves, tides and currents prevail, a rapid return to the status-quo is attained. In many areas of Brittany it is already difficult to find any effects from the Amoco-Cadiz accident, whereas effects in calmer waters may remain for a long time. And in sandy areas the oil may remain buried for years. In places like these it takes a very [in boldface] long time, maybe decades, to return to the original state.

In West Falmouth, USA about 7,000 liters of fuel oil nr. 2 washed ashore in September 1969. West Falmouth is the city where the Wood's Hole Oceanographic Institute has its headquarters. This small oil spill, relatively speaking, was studied very thoroughly over a long period of time by both chemists, microbiologists and zoologists. It was demonstrated that in areas with strong

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waves and currents, the flora and fauna rapidly returned to normal, but in an area with low tide there were great aberrations from normal even ten years later. Since no oil spills, anywhere in the world, have been followed up over a longer period of time, we really do not know how long the effect of oil spills will remain visible, especially in sensitive areas.

Dramatic Natural Variations as Well

The amount of herring along the Norwegian coast varies periodically. When there is a large amount of Skagerrak herring the amount of Rogaland-, Stadt- and Lofoten herring is greatly reduced. And when the number of the three last mentioned herring species is greater than normal, there is a reduction in the Skagerrak herring.

Studies in regard to the number of fish have been going on in the English Channel for quite some time. During the 20's there was heavy fishing for herring and the number of herring declined dramatically in the years 1928-30. Around 1938 there was extensive fishing for pilchard (brisling) instead of herring. But in 1965 this changed again, and there was more herring and less brisling. Off the California coast the number of sardines and anchovies have varied over many centuries. This has been established from fish-scales preserved in sediment. The age of the sediment was determined through carbon-dating 14, and in this manner the periodic fluctuations have been reconstructed.

This can lead to practical problems. It could happen, for instance, that the amount of one kind of fish would begin to decline in an area at the same time as a new production-platform was put into operation. In all likelihood the oil company would then be blamed despite the fact that the fish population demonstrates decade-long periodic cycles.

There is no definite explanation for these fluctuations. But the amount of plankton in the North Sea has changed dramatically between 1950 and 1961, and it is clear that this will impact on the fish population. Changes in the wind conditions in the North Sea area probably cause changes in the amount of plankton and in turn also affect the amount of herring. The important point is that fluctuations in climatic factors cause dramatic changes in the quantity of marine organisms, and that these variations take place over decades.

Marine biologists are just beginning to discover the complexity of such variations. And it is against this background of continuous fluctuations in stock that one must attempt to measure the long range effect of oil pollution.

Norwegian Pioneer Project

If the generalization is made that oil damage not presents a serious problem, it can only be made in connection with definite, local conditions. One cannot use data from the Mexican Gulf as an argument for what might happen in Norway. This is the reason that we in Norway should invest large amounts of money for studies of the possible effect of oil on marine life.

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The Environmental Protection Department has its FOH [expansion unknown] program dealing with pollution of sea water. The objective of this program is to study pollution in general and not the effect of oil in particular. But oil is of course a central theme and the development of ecologically relevant technology is the same for all types of polluting substances.

In order to measure the effect of many, but small, oil spills one has to know the correct background conditions. Therefore studies of the content of hydrocarbons (which come from petroleum) of marine organisms are underway. These organisms today live in clean areas which could become polluted in the future. The variations of decades will be registered, as will the variations between species.

But what would happen if there were to be a large oil spill in Norwegian coastal waters? Although much research is in process as to the effect of oil spills, most of the data have been collected after the discharge. And there are very few quantitative data available. The Norwegian plan aims for developing quantitative data for areas which might be exposed.

The plan is not to study what happens in areas chosen at random but to wait until the oil spill is a fact. One can then observe the course taken by the polluting oil, and only when there is reasonable certainty as to what stretch of the coast will be affected will the plan go into effect. Experienced ecologists will immediately move out and make a rapid investigation along a stretch of several miles. Altogether there are seven groups of scientists who stand ready at all times to carry out such an assignment. They cover the entire Norwegian coast, from Svinesund to the Grense Jakob River. By means of photography and test samples for later analysis, they will make a quantitative survey of the amount of important species in the area. After the oil spill has produced its effect, this can then be measured quantitatively over a larger area.

Even if these data cannot be said to be collected along the classical scientific lines, they will reflect a very good quantitative picture of the effect of oil spills. Until now such experiments have not been undertaken in any other place in the world. They are, however, of decisive importance for collecting those data which will provide us with the possibility for assessing the effects of oil spills along the Norwegian coast in a precise and rational manner. The only question remaining when one thinks of the complexity of the marine environment is: Can sufficient data be collected while there is still time?

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1. The first part of the document is a list of names and titles of the members of the committee. The names are listed in alphabetical order. The titles are listed in the order in which they appear in the document.

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